ISLAMIC DEVELOPMENT BANK
ISLAMIC RESEARCH AND TRAINING INSTITUTE

A MICROECONOMIC MODEL OF AN ISLAMIC BANK

Habib Ahmed

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FOREWORD

The Islamic Research and Training Institute (IRTI) of the Islamic Development Bank (IDB) was established in 1401H (1981G) "to undertake research for enabling the economic, financial and banking activities in Muslim countries to conform to *Shari'ah*". In order to discharge its responsibilities, IRTI pays special attention to basic and applied research in the areas of Islamic economics, banking, and finance relying on its in-house research capabilities and mobilizing external scholars.

From an urge to stay away from interest, which is prohibited by *Shariah*, Islamic banking was revived some three decades ago. When the idea of Islamic banking was mooted, it was proposed that Islamic banking would adopt profit-sharing modes of financing (*mudarabah* and *musharakah*). Experience, however, shows that Islamic banks predominantly use fixed-income instruments (like *murabahah* and *ijarah*) on the asset side. While some explanations have been given to explain this trend, this paper examines the issue by modeling an Islamic bank. The model, using concepts from contemporary banking theories, identifies the fundamental nature of Islamic bank as an intermediary. The research paper explains why Islamic banks choose relatively less risky fixed-income instruments and argues that the share of profit sharing instruments can be increased if Islamic financial institutions operate as investment intermediaries instead of liquidity providers.

As the Islamic financial industry operates in highly competitive markets it must be able to offer attractive risk-return opportunities to both investors and user of funds. The future growth and sustainability of Islamic financial industry will depend on the ability of the researchers and practitioners to understand the nature of Islamic instruments and institutions and develop these in line with the principles of *Shari'ah*. To do so, the different aspects of Islamic banking and finance need to be studied analytically. This paper is one of the first microeconomic models of an Islamic bank. I hope that the publication of this research paper will stimulate further research along these lines.

Mabid Ali Al-Jarhi

Director, IRTI

A MICROECONOMIC MODEL OF AN ISLAMIC BANK

1. Introduction

With the inception of Islamic banking in the early 1970s, it was believed that it would take the form of two-tier *mudarabah* model. Proponents of Islamic banking pointed out the advantages of profit-sharing modes of financing over the conventional interest based financing. These include increase in investment, allocative efficiency, stability, equity and reduction of poverty.[1] Experiences, however, show that fixed-income short-term instruments (like *murabahah,* mark-up financing) are the dominant modes of financing used by Islamic banks. Various reasons are given to explain the lack of use of profit-sharing modes by Islamic banks, the most significant being the moral hazard problem.[2] This is disheartening to the proponents of Islamic banking as some of them fear that using fixed-income instruments may not be in the true spirit of Islam as it represents the status quo (Chapra 1985, p.171 and Siddiqi 1983, p.139). Though an Islamic economy cannot be a "pure profit sharing" economy, there is an aspiration to have a balanced mix between fixed-income and profit-sharing (hereafter PS) modes of financing (Al-Jarhi 1999). The success of the use of PS modes of financing, however, will depend on understanding the problems associated with their use. This paper addresses this issue by studying the nature of Islamic banks in light of contemporary banking theory. By modeling an Islamic bank, the paper seeks to identify the causes of the modest use of PS instruments and then discusses some related operational issues.

The paper is organized as follows. In section 2 we discuss different aspects of conventional financial intermediation and features of Islamic banks. Section 3 reviews literature on contemporary banking theory, both conventional and Islamic. Section 4 first outlines a model of an Islamic bank as liquidity provider. After discussing the nature of liability of the bank, we show how the

[1] The advantages of Islamic banking are discussed in Chapra (1985) and Khan (1995a), and Siddiqi (1981 and 1983).

[2] For a discussion on the lack of profit sharing modes of financing by Islamic banks see Khan (1995b).

composition of the asset is determined. The section then discusses the role an Islamic bank as an investment intermediary. Section 5 elaborates some operational issues related to Islamic banks. The paper ends with a conclusion.

2. Nature of Banks: Conventional and Islamic

The objective of financial institutions is to maximize profit and shareholder value-added by providing different financial services. This is achieved mainly by managing risks (Heffernan 1996, p. 163, Scholtens and Wensveen 2000, p. 1247). Risks can be classified in different ways. One broad classification is to distinguish between business risk and financial risk. While business risk arises from the uncertainty of income flows due to the nature of a firm's business, financial risk exists in leveraged firms (Reilly and Brown 1997, p. 20). Some of the other specific risks that financial institutions face are credit risk, liquidity risk, interest rate risk, operational risk, and capital or solvency risk.[3]

From a management point of view, Oldfield and Santomero (1997) divide risks into three types: risks that can be eliminated, those that can be transferred to others, and risks that can be managed by institutions. The practice of conventional financial intermediaries is to take up activities in which risks can be efficiently managed, shift risks that are transferable, and avoid activities that impose additional risks upon them (Santomero 1997). Thus, to understand the nature of any financial institution one has to examine the kind of risks they face and investigate how they deal with it. To discuss Islamic banks in same perspective, we examine the characteristics of conventional financial institutions. This is done next.

2.1. Nature of Conventional Banks

An effective financial system "facilitates the efficient life-cycle allocation of household consumption".[4] To enable this allocation, different financial institutions have evolved to meet the various needs of households. Financial intermediaries are broadly classified as depositary institutions,

[3] See Koch (1995) and Heffernan (1996) for a discussion on different types of risks that financial institutions face.

[4] A quote by R.C. Merton cited in Friexas and Rochet (1999, p. 1)

contractual intermediaries, and investment intermediaries.[5] Commercial banks, forming the bulk of depositary institutions specialize in intermediation, obtaining most of their loanable funds from deposits of the public. As banks deal with interest-based deposits, they face financial risks. They deal with risks by using interest-based contracts on the asset side backed by collateral. Commercial banks are *stock* intermediaries in the sense that they are owned by the stockholders of the bank who receive a share of the profit derived after deducting all costs including interest payment to depositors from income.

Investment intermediaries offer liquid securities to the public for long-term investment. Investment intermediaries are *mutuals,* with customers being the owners who receive income in the form of dividends and capital gains. Being stockowners, customers can vote in matters that affect the institution (Rose and Fraser 1988, p. 15). Investment intermediaries typically invest in secondary markets and, as such, avail investors opportunities to hold securities of private and public institutions. Investment intermediaries being mutuals, eliminate financial risks but take on business risks.

Note that depending on the regulatory framework of a specific country, financial institutions may perform different functions. For example, universal banks are consolidated institutions providing different financial services that may include intermediation, investment management, insurance, brokerage, and holding equity of non-financial firms (Heffernan 1996). A simple case of universal bank is one in which the liability is the same as that of the commercial banks, but the asset side differs. While the assets of a typical commercial bank are in form of loans only, universal banks can hold equity along with loans. By holding equity positions, universal banks can essentially get involved in the decision making and management of the firm.[6]

It is important to point out the role of financial intermediaries from the depositors' perspectives. An efficient financial system should be able to fulfil

5 Contractual intermediaries constitute insurance firms and pension funds. These institutions are not discussed as they are not related to this paper.

6 A distinction is made between narrow banking and fractional banking. Wallace (1996), however, shows that narrow banking requiring banks to back demand deposits by safe short-term liquid assets (implying 100 percent reserve ratio) eliminates the role of banking. The solution under narrow banking is similar to that of individuals acting alone (autarky) so that there is no need for financial intermediation by banks. The implication of this conclusion on Islamic banks does not directly concern this paper.

the current and future financial needs of the people. Specifically, individuals hold a part of their savings in form of liquid assets for current and unforeseen needs and invest the rest in assets with different risk/return/maturity profiles. While investment intermediaries provide the investment opportunities to the public, a unique role of commercial banks is the provision of liquidity and access to a safe and efficient payment system through deposits (Friexas and Rochet 1999, p. 2). Liquidity risk is the uncertainty with regards to an asset's convertibility into cash and price at which it is done (Reilly and Brown 1997, p. 21). In conventional banking, deposit contracts ensure liquidity to depositors, both in terms of cash and price (i.e., interest paid in deposits).[7]

2.2. Nature of Islamic Banks

Iqbal et.al. (1998) distinguish two models of Islamic banks based on the structure of the assets.[8] The first is the two-tier *mudarabah* model that replaces interest by profit-sharing (PS) modes on both liability and asset sides of the bank. In particular, in this model all assets are financed by PS modes of financing (*mudarabah*). This model of Islamic banking will also take up the role of an investment intermediary, rather than being a commercial bank only (Chapra 1985, p. 154). The second model of Islamic banking is the one-tier *mudarabah* with multiple investment tools. This model evolved because Islamic banks faced practical and operational problems in using profit-sharing modes of financing on the asset side. As a result, they opted for fixed-income (FI) modes of financing. The FI instruments include *murabahah* (cost-plus or mark-up sale), installment sale (medium/long term *murabahah*), *bai-muajjal* (price-deferred sale), *istisna/salaam* (object deferred sale or pre-paid sale) and *ijarah* (leasing).[9]

On the liability side of Islamic banks, saving and investment deposits take the form of profit-sharing investment accounts. Investment accounts can be further classified as restricted and unrestricted, the former having restrictions on withdrawals before maturity date. Demand deposits or checking/current

7 The exception being the case of a bank run with no deposit insurance.

8 Iqbal, et.al. (1998) mention three models, the third one being the case where Islamic banks work as agent (*wakeel*), managing funds on behalf of clients on basis of fixed commission.

9 For a discussion on these modes of financing see Ahmad (1993), Kahf and Khan (1992), and Khan (1991).

accounts in Islamic banks take the nature of *qard hasan* that are returned fully on demand. Using PS principle to reward depositors is a unique feature of Islamic banks. This feature, however, changes the nature of risks that Islamic banks face. Some important issues related to Islamic banks are discussed below.

2.2.1. Islamic Bank: Commercial Bank or Investment Intermediary?

The Islamic bank described above appears to have characteristics of both investment intermediary and commercial bank. The ownership pattern of the Islamic bank resembles that of a commercial bank as the depositors do not own the bank and do not have voting rights. In Islamic finance parlance, this means that while *musharakah* contract characterizes the equity owners, deposits take the form of *mudarabah* contracts.[10] An Islamic bank, however, has similarities with an investment intermediary as it shares the profit generated from its operations with those who hold savings/investment accounts. After paying the depositors a share of the profit, the residual net-income is given out to the shareholders as dividends.

2.2.2. Asset-side versus Liability-side Mudarabah

The PS contract on the asset side and liability side of an Islamic bank are different. Historically, *mudarabah* and *musharakah* were partnerships for specific projects. The fund provided by the fund-owner (*rab-ul-maal*) to the fund-user (*mudarib*) is not debt, as the ownership of capital remains with its provider during the life of the project. Upon the completion of the project, capital and share of profit is returned to its owner. An appropriate contemporary financing technique using PS modes would be diminishing *musharakah* principle in which the bank sells off its shares to the entrepreneur in installments.[11] Though the nature of *mudarahah* contracts on the asset side of an Islamic bank will be different from the traditional model, the contract may still attach funds to individual projects for a relatively longer time. This, however, is not the case with the *mudarabah* contract on the liability side (i.e., deposit). The deposits can be withdrawn by their holders at relatively short

[10] One difference between *musharakah* and *mudarabah* is that while in the former the financier has a role in management of the project, it does not in the latter case.

[11] For a discussion on diminishing *musharakah* see Bendjilali and Khan (1995).

notice.[12] In other words, whereas on the liability side the contract is usually unrestricted (in terms of liquidation), on the asset side it is restricted (funds flow after the contract matures).

2.2.3. Equity versus Deposits on the Liability Side

Other than ownership feature pointed above, equity holders and depositors are fundamentally different in some other respects. These differences can be viewed from two perspectives. One way to look at the difference is the attitude of the equity-holders and depositors towards risk and return. Depositors will be more risk averse than equity holders and opt for a low risk/return deposit contracts (Gangopadhyay and Singh 2000). The implication is that the equity holders are willing to take up more risks that are compensated by a higher expected rate of return.[13]

Another important difference between equity and deposits relates to liquidity. When a depositor needs cash, he can withdraw funds from his deposits reducing the liability of the bank. Note that with restricted deposits this can be done at a cost. An equity-holder in need of cash, however, sells securities in the secondary market without affecting the equity-capital held by the bank. As will be seen, this difference has important implications on the balance sheet and liquidity management of the bank (discussed in section 5).

2.2.4. Primary and Secondary PS Assets

Islamic banks may differ from investment intermediaries in one important way. This difference relates to the role of the institutions in the financial system. Whereas most investment intermediaries are asset managers, banks are involved in financing. The former institutions deal in the secondary markets where only the ownership of existing securities (secondary PS assets) change hand. Other than initial public offerings (IPOs), investment intermediaries' activities do not directly affect the capital of firms. While

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12 Restricted investment accounts may be relatively less liquid. Nevertheless, these deposits can be withdrawn at a cost in a relatively shorter period of time. For a discussion on the nature of *mudarabah* deposits in Islamic banks, see Ahmad (1997).

13 Empirically it has been found that rate of return on equity is much higher than can be explained by the risk-premium. This is termed as the 'equity premium puzzle' in the literature. See Kocherlakota (1996) and Mehra and Prescott (1985) for a discussion on equity-premium puzzle.

Islamic banks can invest in securities (as mutual funds do), PS modes on the asset side of a bank are designed to be financing instruments. In other words, Islamic banks can directly finance firms (primary PS assets), thereby increasing their capital and productive capacities. Financing primary PS assets can be done on the principle of diminishing *musharakah*. As the shares of primary PS assets cannot be traded in secondary markets, they are not as liquid as secondary PS assets.

2.2.5. Nature of Risks

Using PS modes changes the nature of risks that banks face. As demand deposits are considered as *qard-hasan* or debt and its repayment is guaranteed, the bank faces financial risks in using these deposits. By sharing the returns with the saving/investment depositors the bank eliminates financial risks but introduces some other risks. As the depositors are rewarded on a profit-loss sharing (PLS) method, they share the business risks of the banking operations of the bank. Rewarding depositors with banks' variable profit introduces some additional risks (AAOIFI 1999, p.7). First is 'fiduciary risk' that arises from breaching of investment contract or mismanagement of funds by the bank. Second, 'displaced commercial risk' is the transfer of the risk associated with deposits to equity holders. This arises when under commercial pressure banks forgo a part of profit to pay the depositors to prevent withdrawals due to a lower return.[14]

The withdrawal possibility due to lower rate of return is a unique feature of an Islamic bank as returns on their deposits can vary. Depositors want to protect the real value of their assets. In an Islamic environment the real value of deposits will decline not only due to inflation, but also due to *zakat* dues. A variable rate of return on saving/investment deposits further introduces an additional source that may affect real value. PLS returns on deposits add to the uncertainty regarding the real value of deposits. Asset preservation in terms of minimizing the risk of loss due to a lower rate of return may be an important factor in depositors' withdrawal decisions. From the bank's perspective, this

[14] Though there is no formal *Shariah* approval that permits transferring profit from the owners of the bank to depositors, there appears to be no *Fiqhi* objections to do the same. For example, Fahmy (2001, p.22) is of the opinion that as long as there is positive profit (no loss), the owners of the bank can opt to transfer a part of their profit to the depositors.

introduces a 'withdrawal risk' that is linked to the lower rate of return. A recent survey of 17 Islamic financial institutions indicates that these institutions consider withdrawal risk more serious than some of the traditional risks (like credit risk, market risk, liquidity risk, etc.) that financial institutions face.[15] In our model of an Islamic bank, we use withdrawal risk and point out how the displaced commercial risk arises when discussing operational aspects in Section 5.

3. Banking Theories and Islamic Banking

In this section, we review literature on contemporary conventional and Islamic banking theories. Conventional microeconomic models of banks can be broadly classified into three types.[16] The first kind focuses on the asset side of the banks, the second type examines the liability side, while the third combines elements of both assets and liabilities. A brief description of these models is given below.

Models focusing on asset side of the balance sheet of the bank view banks as institutions acting as specialized in monitoring to minimize asymmetric information problems involved in investment (Diamond 1984 and Ramakrishan and Thakor 1984). Two types of information problems can arise in financing projects. First, adverse selection problem arises before a contract is signed as the borrowers (firm owners/managers) have more information on the project than the investors (or bank). The investors, as such, are in disadvantageous position to sort out the good projects for investment. Second, moral hazard problem may arise after the investment has taken place. In this case, the investors cannot ascertain if the borrower's behavior is in accordance with what is stipulated in the contract. By acting as intermediaries, banks minimize the asymmetric information problems and lower the monitoring costs that would have encountered if each investor would have invested individually. By pooling funds from individual investors (depositors) for different investment projects, they can also diversify their assets to reduce the risks involved.

Theoretical work of Diamond and Dybvig (1983) and Gangopadhyay and Singh (2000) represent the liability side approach to banking theory. These

[15] See Khan and Ahmed (2001, Chapter 3) for details of the survey.

[16] For surveys of banking theories, see Bhattacharya, et.al. (1998) and Bhattacharya and Thakor (1993).

models focus on the banks' role of liquidity transformation. They assume that individuals experience random shocks in future consumption and deposit contracts serve as insurance to such shocks. Without an intermediary, individual investors will be locked in illiquid investments. In case of a shock, investors are able to liquidate these long-term investments at a cost. By providing deposit contracts to individuals, banks transform liquid liability into illiquid assets. Diamond and Dybvig (1983) model of deposit financing yields multiple equilibria, one of which can cause bank runs. Gangopadhyay and Singh (2000) show how by converting deposits into equity a bank-run can be avoided even without deposit insurance.

Bhattacharya et.al. (1998) provide an integrated model in which banks provide both asset and liability intermediation. In this model, depositors and entrepreneurs are distinct and the bank borrows from the depositors and lends to entrepreneurs through independent debt contracts. A coordination failure, however, can occur when a large number of investors (depositors) withdraw funds, causing a bank-run. Bank runs adversely affects the economy as they force liquidation of entrepreneurs' projects before maturity.

There is a large volume of literature on different aspects of Islamic banking. The earlier work on the subject focused on the PS modes of financing and its implications on the economy (for example see, Chapra 1985, Khan 1987, Khan 1995a, and Siddiqi 1981, 1983 and 1991). Most papers, however, assume Islamic banks would use PS modes of financing without addressing why Islamic banks have failed to adopt these instruments in practice. Some more recent studies explain the causes of Islamic banks' lack of use of PS modes of financing.

Khan (1995b) discusses different reasons that hamper the use of PS modes of financing. He focuses on the asset side of the bank and discusses the demand (fund user) and supply (bank or the investor) sides. He points out, among other things, that firms prefer FI modes of financing as they can reinvest their surpluses to enhance growth. Aggarwal and Yousef (2000) model an Islamic bank and explain the lack of use of sharing modes due to agency problems. Their paper also concentrates on the asset side of the bank's balance sheet. They outline the conditions under which an equity contract is optimal in financing. Profit sharing equity contracts work well when the cost of the project is small and rate of diversion (due to moral hazard) is low. They conclude that PS (equity) contracts are not being used due to severity of moral hazard

problem faced by the banks. Mirakhor (1987) uses a micro-model to explain the dominance of short-term instruments used by Islamic banks. He examines the balance sheet and maintains that banks are worried about bankruptcy and would keep bank losses lower than total capital. To do so the banks invest in short-term mark-up instruments.

This paper differs from earlier work in significant ways. We use elements from contemporary banking theory to model an Islamic bank. We examine both sides of the balance sheet and analyze the effect of liability side on the composition of the assets of a bank. In particular, we consider the risks associated with PS modes to understand the nature of Islamic bank and its operations. The details of the model are given below.

4. Model

An effective financial system fulfils the current and future financial needs of the people. While households hold a part of their savings in form of liquid assets for current and unforeseen needs, they invest the rest in assets with different risk/return/maturity profiles. As mentioned above, a unique role of commercial banks is the provision of liquidity and access to a safe and efficient payment system through deposits. An Islamic bank, however, would also take the role of an investment intermediary. Given these features, we proceed in two steps to develop a theoretical model of an Islamic bank. First, we examine an Islamic bank providing liquidity services to depositors. As such, the bank offers demand deposits and savings (unrestricted investment) deposits. The depositor can withdraw funds from these accounts without any cost. In the second step, we include the investment intermediary nature of Islamic banking by incorporating (restricted) investment deposits. Withdrawing funds from these accounts entails a cost to the depositors. Note that while the bank guarantees payment of funds on demand deposits, it shares profit/loss with saving/investment account holders. [17]

4.1. Islamic Bank as a Provider of Liquidity

[17] In reality, a whole spectrum of different accounts can be offered by banks. We include savings account not only because Islamic banks provide these accounts, but also because it enables us to study an Islamic bank offering liquidity services with returns like a conventional interest-bearing bank.

Our partial model of an Islamic bank uses an integrated approach by studying both the asset and liability sides of the bank. In modeling a bank as liquidity provider, we follow Diamond and Dybvig (1983) and Gangopadhyay and Singh (2000). They classify depositors randomly as those having short and long-term needs for funds in the future. As a result, their papers focus on an exogenous risk that banks face due to random withdrawals of deposits. As depositors get a share of profit of the bank in an Islamic banking setting, withdrawals due to asset preservation arise endogenously. The return/risk on deposits will be closely linked to the corresponding figures of the assets of the bank. As mentioned above, this feature introduces fiduciary, displaced commercial, and withdrawal risks in Islamic banking. We introduce the latter risk in our model.

Assume that no deposit insurance exists. Assume also that the bank has equity, E, and offers demand deposits (D_d) and savings account (D_S) only. Thus, the total deposits in the bank is $D= D_d+D_S$ held by m number of clients. To keep our analysis manageable we consider only two kinds of assets other than reserves; viz. fixed-return assets (e.g., *murabahah* and *ijarah*) and profit-sharing assets (*modarabah*). The balance sheet of the bank indicates that total assets (A) must equal deposits and equity (i.e., $A=D+E$).

Conventional banking theory maintains that fixed interest-based loan (backed by collateral) is an optimal contract in minimizing the moral hazard problem arising in financing. In the conventional interest based contract, a firm taking a loan of I at an interest rate r to finance a project pays an amount of $D_0=(1+r)I$ in the next period. Note that here the bank shifts risk to the firm. To have a discussion in some perspective, we take this optimal case as a benchmark for analyzing the Islamic cases.

4.1.1. Liability Side

As mentioned above, people have different financial needs and place their funds in different assets accordingly. In forming their portfolios, a part of savings is put aside in liquid assets so that current and unexpected expenses can be met. The rest will be put in assets/investments with different risk-return profiles. People will have different attitudes towards risk and return for various kinds of assets. While agents will be relatively more risk-averse with assets used for liquidity (e.g., demand/saving deposits), they will accept more risk with other assets with higher expected returns.

We assume that a share of the funds set aside for liquidity purposes is deposited partly in demand deposits and partly in savings account. People use savings account mainly to protect the real value deposits from inflation and *zakat* dues. Let the expected rate of return on saving deposits be r^e and standard deviation of σ_r. As depositors of Islamic banks get a share of profit, the return and risk of deposits will be closely linked to that of the banks assets. That is,

$$r^e = f(r), \qquad f' > 0; \text{ and}$$

$$\sigma_r = g(\sigma), \qquad g' > 0;$$

where r and σ are the rate of return and standard deviation of assets of the bank.

While a depositor knows that there are risks involved on returns on savings account, he may react if the rate of return of the bank is too low.[18] If the minimum rate of return that is acceptable to depositor m is r^m, then a tolerance level of this depositor (ε_m) is defined as the difference between the expected and this minimum return on deposits (i.e., $r^e - r^m = \varepsilon_m$). Note that while attitude towards risk will be the main determinant of this index, for a Muslim it may also be influenced by the level of his/her religious belief and feelings that induces him/her to use an Islamic bank in the first place. *Ceteris paribus*, a fall in real value of deposits by more than the tolerance level will lead to a withdrawal of funds by the depositors to other alternatives. Thus, ε_m represents the minimum decrease in the rate of return acceptable to depositor m in order to keep his money with the bank. Specifically, if the actual rate of return (r^a) is low enough to give $(r^e - r^a) > \varepsilon_m$, then the depositor will withdraw the funds from the bank. We call the resulting withdrawals as asset-preservation withdrawals and this points to the withdrawal risks faced by Islamic banks.

Thus, total withdrawals W from the banks during a period of time (say a week) equals,

$$W = \psi D + V(q), \qquad 0 < \psi < 1; \qquad (1)$$

[18] Note that being a partial equilibrium model, we are assuming other things constant. The reaction of depositors to a lower rate of return will depend on whether bank under-performs in isolation or due to a general downturn of the economy. This is discussed in Section 5.

where ψD represents the average amount of normal withdrawals during the period for their current transactional needs and V represents the asset-preservation withdrawals described above. Asset-preservation withdrawals increase with q, the probability that the minimum rate of return that depositors expect is not guaranteed (i.e., when r^e- r^a $>\varepsilon_m$). Note that in a conventional banking setting with deposit insurance, the probability q is close to zero, as the deposit along with the interest payment is guaranteed. In Islamic banking, however, as the rate of return on deposits can vary as it depends on the overall yield of the bank's portfolio, the probability will be positive. We use Chebychev's inequality to determine this probability for individual m.[19] For a random variable r with expected value of r^e and variance σ_r, the Chebychev's inequality is given by,

$$q = \text{Prob}\ (|r-r^e| > \varepsilon_m) \leq \sigma^2{}_r/\varepsilon_m{}^2 \qquad (2)$$

The probability of asset-preservation withdrawals, q, may increase with the risk of the returns on deposits σ_r, and may decrease with the individual tolerance factor ε_m. As the rate of return of deposits is directly linked with rate of return on bank's portfolio, the asset-preservation withdrawals V will be affected by the overall risk of the bank's portfolio (σ). Thus, the asset-preservation withdrawals can be written as,

$$V=V(\sigma\ ,\ \varepsilon_m)= V(\sigma\ ,\ r^e\text{-}r^m) \qquad (3)$$

Note that asset-preservation withdrawals varies directly with the risk of the assets (σ) and inversely with the tolerance factor (ε_m= r^e-r^m). In other words, withdrawal risk of an Islamic bank increases with overall risk of the bank's portfolio.

Tolerance level for asset preservation ε_m will differ from one depositor to another as people have different attitudes towards it. At one extreme, a depositor may expect a positive rate of return after factoring for inflation and *zakat* while at the other end a depositor may not worry about these at all. Between the two extremes, there will be an array of depositors who will have a varied tolerance levels of how much a fall in the value of real balances they would sustain. If $w=W/A=W/(D+E)$ is the withdrawals to asset ratio, then this variation of tolerance among depositors can be represented by an upward sloping withdrawal curve, $w(\sigma)$, as shown in Figure 1. This curve indicates that

19 See Greene (1997, p. 116) for Chebychev's inequality.

a rise in the overall risk of a bank's assets (σ) increases the probability of withdrawal of deposits from the bank (w). Note that the predictable component of withdrawals due to current transactional (ψD) needs is shown by w_0 in the figure.

4.1.2. Asset Side

We have noted that the variance of the returns on deposits is directly linked to the variance of the returns on assets of Islamic banks and the probability of withdrawals may increase as the bank holds more risky assets. This leads us to examine the risk-return characteristics of different assets held by an Islamic bank. We assume that the bank invests in primary PS assets so that it directly invests and increases the capital of the firm.[20] Specifically, the bank can invest an amount of I in a representative firm that yields a probability distribution of profit (net-income) of y_i as shown in Table 1.[21] Let the mean and variance of the outcome of the project be μ_y and σ_y respectively. Note that some of these outcomes ($h<n$) will be negative (i.e., $y_1<y_2<...< y_h=0$). Given this probability distribution, we outline the risk-return features of FI and PS modes of financing next.

Case 1 (Fixed-Income Assets): The bank finances the entrepreneur by using an Islamic fixed-income (FI) mode of financing involving payment-deferred sale (e.g., *murabahah*). The firm pays the bank $D_0=(P+\eta)Q$, where P is the price of assets (Q) sold to the firm by the bank and η is the mark-up. Note that $PQ=I$. Though Islamic FI mode of financing is different from the conventional interest based financing, the financial flows from these contracts appear similar.[22] The expected return and risk of the bank in this transaction are $R^f_b=\mu_f=D_0$, and $\sigma^f_b(\approx 0)$ respectively.[23] The corresponding figures for the firm are

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[20] The implication of investing in secondary PS assets is discussed in Section 5.

[21] The implicit assumption of y_i being independent, identically distributed (i.i.d.) is made to keep the analysis simple. Other than avoiding complications, the i.i.d. assumption is appropriate for analysis as the focus of the paper is to compare individual modes of financing and not issues related to a set of assets (like benefits of diversification).

[22] For a discussion on the differences between conventional interest-based loan and Islamic sale-based debt (*murabahah*), see Chapra and Khan (2000, p.10) and Al-Jarhi (2000).

[23] In a *murabahah* contract, risk borne by the bank is limited up to the point when the good is handed over to the entrepreneur. Once the good is handed to the

ase 2 (Profit-Sharing Assets): We consider a *mudarabah* type profit-sharing (PS) contract in which the bank provides funds and the entrepreneur acts as an agent (*mudarib*) to implement the project. Let the profit-sharing ratio be θ so that the bank gets a share of θ percent of the profit (and 1-θ percent is retained by the entrepreneur).[24] Note, however, that under a *mudarabah* contract all loss from the project is borne by the bank.[25] As shown in Table 1 below, the probability distribution of the outcomes in a PS contract for the bank and the entrepreneur is different from that in the FI case. In the PS case, the net-income of the entrepreneur in states j=1…h becomes zero (i.e., $y^e_1 = y^e_2 = \ldots = y^e_h = 0$) and equals $(1-\theta)y_k$ in states $k=h+1, \ldots n$. The outcome for the bank is y_j<0 for states $j=1,2,\ldots h$ and θy_k for states $k=h+1, \ldots n$.

Table 1
Probability Distribution of Profit of the Project, the Bank, and the Firm in a Profit-Sharing Contract

Probability (p_i)	***Project Profit (y_i)***	***Bank (PS-case)***	***Firm (PS-case)***
p_1	$y_1<0$	$y_1<0$	0
p_2	$y_2<0$	$y_2<0$	0
.	.	.	.
.	.	.	.
.	.	.	.
p_h	$y_h=0$	$y_h=0$	0
p_{h+1}	$y_{h+1}>0$	$\theta y_{h+1}>0$	$(1-\theta)y_{h+1}>0$
.	.	.	.
.	.	.	.
.	.	.	.

entrepreneur, all risk is borne by him, making the risk of the bank very small in a *murabahah* contract (Khan 1991, p. 14.)

24 We assume θ is exogenously given in the model determined by mutual agreement of the bank and the firm. For a discussion on determining the profit-sharing ratio in project financing, see Ahmed (2001).

25 In the *mudarabah* contract, the profit is shared, but loss is borne by the owner of the capital. The entrepreneur (*mudarib*) loses his efforts.

p_n	$y_n>0$	$\theta y_n>0$	$(1-\theta)y_n>0$

The assumption of asymmetry in outcomes in loss and profit situations alters the expected income and risk (variance) of both the bank and the firm. The expected income and variance of the entrepreneur in the PS case are $R^p{}_e= (1-\theta)\ \Sigma_k p_k y_k$ and $V^p{}_e= (1-\theta)^2 \Sigma_k p_k y_k{}^2 -(R^p{}_e)^2$ respectively. The corresponding values of the bank are $R^p{}_b$ and $V^p{}_b$ respectively, as shown below.

$$R^p{}_b = \mu_p = \Sigma_j p_j y_j + \theta \Sigma_k p_k y_k, \tag{4a}$$

$$V^p{}_b = \sigma_p{}^2 = \Sigma_j\, p_j y_j{}^2 + \theta^2 \Sigma_k\, p_k y_k{}^2 - R^p{}_b{}^2. \tag{4b}$$

The asymmetry in the rewards in the *mudarahah* contract (i.e., sharing profit without sharing losses) has important implications on the expected return and risk of the bank. Accepting all financial losses biases the return and risk against the bank. This is apparent if we compare the profit sharing (with no loss sharing) (PS) case with the case where both profit and loss are shared. We call the latter as PLS case. The expected return and variance of the bank in case of PLS case is given below,

$$R^{pl}{}_b = \theta \Sigma_j p_j y_j + \theta \Sigma_k p_k y_k \tag{5a}$$

$$V^{pl}{}_b = (\sigma_{bpl})^2 = \theta^2 \Sigma_j\, p_j y_j{}^2 + \theta^2 \Sigma_k\, p_k y_k{}^2 - (R^{pl}{}_b)^2. \tag{5b}$$

Noting that y_j is non-positive, a comparison of the PS case with the PLS case gives the following results

$$R^{pl}{}_b / R^p{}_b > 1; \tag{6a}$$

$$V^{pl}{}_b / V^p{}_b < 1. \tag{6b}$$

The above results indicate that due to asymmetry in profit sharing (PS), the bank's expected return is lower and risk higher than the symmetric PLS case. In other words, due to the asymmetry in the weights in loss and profit, the bank share of expected income is less than the profit-sharing ratio. Similarly, the bank has a larger share in the risk than the ratio at which profit is shared. To compensate for this bias, the profit sharing ratio should be higher to factor in the additional risk and lower profit. For the purposes of this paper, however, we need to discuss the implication of the risk-return elements and its effects on the banks operations. To do so, we summarize the features of assets held by the bank in Table 2 below.

Table 2

Distribution and Financial Attributes of Assets of the Bank

	Cash	***Fixed-income Assets***	***Profit-sharing Assets***	***Portfolio***
Share	γ_c	γ_f	γ_p	$\gamma_c+\gamma_f+\gamma_p=1$
Expected Rate of Return (μ)	$\mu_c(=0)$	$\mu_f\,(>0)$	$\mu_p\,(>\mu_f>0)$	$\mu=\gamma_f\mu_f+\gamma_p\mu_0$
Risk (σ)	$\sigma_c(=0)$	$\sigma_f\,(\approx 0)$	$\sigma_p\,(>\sigma_f\approx 0)$	$\sigma=\gamma_f\sigma_f+\gamma_p\sigma_p$

Table 2 shows that assets of the bank kept as cash (reserves), invested in fixed income (FI) assets and profit sharing (PS) assets respectively as indicated by their corresponding shares γ_i (i= c, f, and p). The risk/return feature of the portfolio of the bank will depend on the relative shares of FI assets and PS assets. For example holding more PS assets will increase the risk of the bank's portfolio of assets. The relationship between the share of FI asset and the risk of the bank's portfolio is given in Figure 1 by the $\gamma_f(\sigma)$ line. This line indicates that an increase in the share of the FI assets or a decrease in the share of PS assets (a larger γ_f) lowers the overall risk (σ) of the portfolio. Note that risk does not equal zero when γ_f=1 as there are some risks (σ_f) associated with FI assets. We discuss the implications of risk on bank operations next.

4.1.3. Risk-Return Profiles of Assets and Vulnerability of Banks

Total withdrawals have a predictable component, ψD, and an unpredictable part, $V(q)$. As Equation (3) shows, the unpredictable component depends on the risks on returns on deposits. If the volatility (or risk) of returns on assets increase, the probability of withdrawals to preserve their asset value increases. In other words, withdrawal risk of the bank increases. If a bank is unable to satisfy large amount of unexpected withdrawals, then the consequences can be disastrous. When depositors learn about the inability of a bank to satisfy withdrawal requests, a large number of them rush to withdraw their money causing a bank-failure. The following conditions show the vulnerability of the bank:

i) $w \leq \gamma_c$ => Bank is not vulnerable

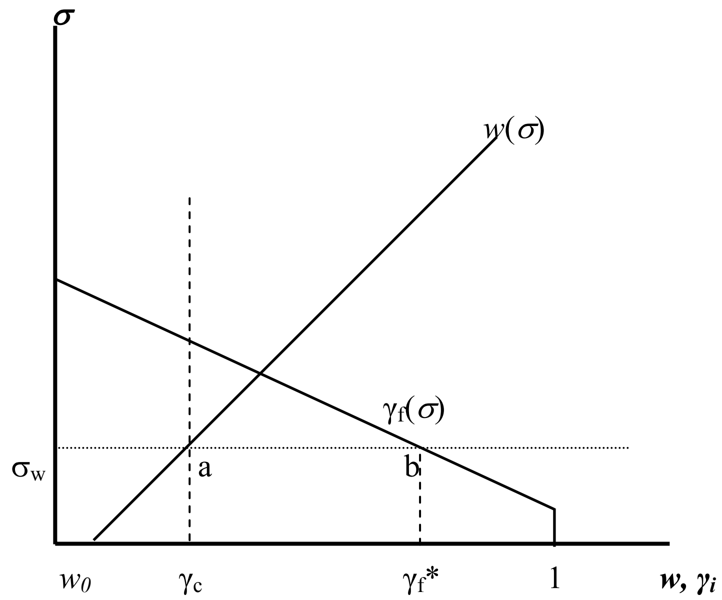
ii) $w > \gamma_c$ => Bank vulnerable to a bank-failure.

where w has been earlier defined as withdrawals as a percentage of liabilities and equity. A bank is vulnerable to a failure if the withdrawals exceed the reserves held by the bank. Given the above framework, in order to avoid bank-run a bank should keep the unpredictable component of withdrawals, V (i.e., asset-preservation withdrawals) as low as possible. As V is directly related to risks of assets (σ), the underlying principle in managing assets is to keep the risks low.

The results of the model are summarized in Figure 1 above. The interaction between the asset and liability side explains why Islamic banks are not using PS mode of financing to finance projects. As mentioned earlier, the risk of bank's portfolio associated with choosing FI assets and PS assets is shown by the $\gamma_f(\sigma)$ line. As the share of FI assets (γ_f) increases the risk of the portfolio (σ) decreases. The effect of risk on the liability side is shown by the w line. As has been pointed out, the withdrawal to asset share (w) increases as the risks on bank's portfolio (σ) increases. This is shown by the upward sloping w curve in the figure. The vulnerability condition of the banks can be ascertained by comparing the share of reserves (cash) that the bank holds relative to the total withdrawals. While cash ratio (γ_c) may be exogenously given by the regulatory authorities, the share of FI and PS assets (γ_f and γ_p respectively) are determined endogenously in the model.

The cash reserve share is given by γ_c in Figure 1. The strategy of the bank is to keep the withdrawal share (w) lower than the cash reserve share (γ_c). As the figure shows, for a given γ_c, the maximum risk that the bank can undertake (and avoid a run) is σ_w. The γ_c curve determines the composition of FI and PS assets that would yield a risk of σ_w. The bank has to choose a minimum of γ_f* as share of FI assets to be on the safe side. This large share of FI assets leaves a small share of PS assets, as γ_p $(=1-\gamma_c-\gamma_f)$. Though this result appears discouraging for the use PS modes of financing, it gives one explanation as to why Islamic banks are not using these instruments in practice. Note that the above results are produced on the assumption that Islamic banks provided liquidity services only. We discuss the role of an Islamic bank as an investment intermediary next.

Figure 1: Islamic Bank as a Liquidity Provider

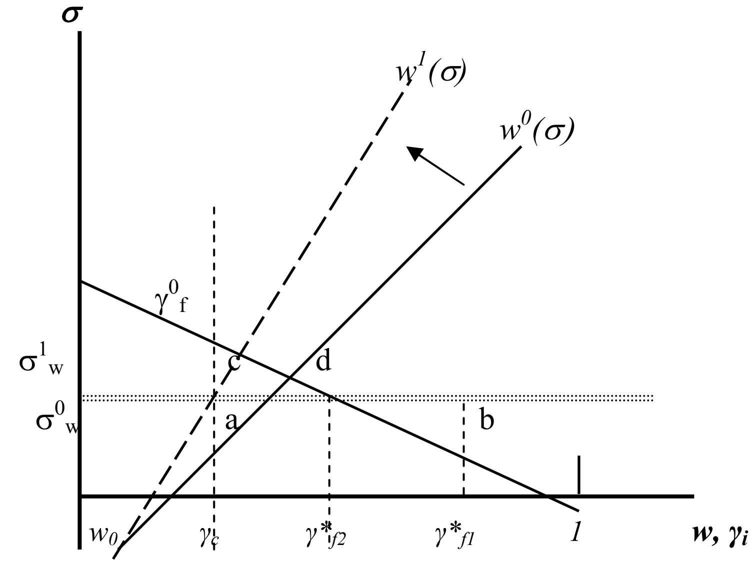


4.2. Islamic Bank as an Investment Intermediary

It has been argued that given the profit-sharing features, Islamic banks also act as investment intermediaries. This role of Islamic banks is reflected by their offering (restricted) investment accounts that offer higher expected rate of return with higher risks. Relatively less risk-averse behavior implies that the tolerance factor (ε_m) for these deposits would be higher. That will reduce the withdrawal risks or asset-preservation withdrawals from investment deposits. Furthermore, these deposits are less liquid as there is a cost of withdrawal of funds. This, along with the higher tolerance factor would mean that the $w(\sigma)$ curve will be steeper for funds in investment accounts. This is shown in Figure 2 below by the rotation of the $w(\sigma)$ curve from $w^0(\sigma)$ to $w^1(\sigma)$, increasing the acceptable risk that bank can undertake on the asset side from σ^0_w to σ^1_w. As the figure shows, we move from point *b* to *d* on the $\gamma_f(\sigma)$ line. This movement indicates that the bank can lower its share of FI asset from γ^*_{f1} to γ^*_{f2} and increase the share of PS assets in their portfolio. Note that the model shows that bank will not invest all of its funds in PS assets, but will have a combination of PS and FI assets in the portfolio.

The above analysis shows that when an Islamic bank acts as an investment intermediary attracting depositors who are willing to take more risks, the bank is in a position to increase the share of assets financed by PS modes. Given this result, a question arises as to why Islamic banks are not investing in PS assets, particularly with funds from investment deposits. One answer to this puzzle may lie in the other explanations given in the literature, in particular the asymmetric information problems that occur more prominently in PS modes of financing.[26] These problems increase the risks on PS instruments, inhibiting their use. Another possibility of the dominance of FI instruments in the assets of Islamic banks, however, may be that they have been operating more like liquidity providers and less like investment intermediaries. This may stem from the hangover from conventional banking practices that most of the managers of Islamic banks are trained in and come from.

Figure 2: Islamic Bank as an Investment Intermediary



5. Some Performance and Operational Matters of Islamic Banks

[26] Boyd, et.al (1998) identify two endogenous sources of moral hazard in financial contracts. One arises when the entrepreneur undertakes an inferior project after funds are provided and the other is costly state verification problem arising from the inability of the financier to observe the actual outcome. The former endogenous moral hazard can also be interpreted as an entrepreneur choosing an effort level that is lower than what is expected *ex-ante* (Santos 1999).

The distinguishing PS features of Islamic banks point out to their investment intermediary nature. This not only has operational and management ramifications, but also affects the performance of Islamic banks compared to their conventional counterparts. We discuss below some implications for Islamic banks in the light of the model given above.[27]

5.1. Stability of Islamic Banks

It has been shown above that Islamic banks can use both FI and PS modes on the assets side. The use of profit-sharing principle to reward depositors on the liability side, however, has important implications regarding the stability and management of banks. To understand this, we discuss how the depositors will react to a lower rate of return relative to other financial institutions in the economy. When we compare the rate of return with other financial institutions, we observe that sharing profit with the depositors not only brings more stability to the bank, but also acts as a disciplinary tool that punishes inefficiencies.

If the return of the bank is low due to an overall downturn of the economy, then this will be reflected in lower returns for all banks. Whereas lower returns on the asset side will be transferred to the depositors in Islamic banks, this will not be the case in case of conventional banks. Linking the return on liabilities to return on assets, brings stability and can avoid bank runs (Gangopadhyay and Singh 2000 and Jacklin 1987). This has been shown by Khan (1987) for Islamic banks. A downturn causing a decline in the value of assets is cushioned by the corresponding decrease in the liabilities, protecting the net-worth of the bank. When depositors see that the overall rate of return in the economy has gone down, the probability of withdrawals will be very small.

If the lower rate of return, however, is restricted to a particular bank then the reaction of depositors will be different. An isolated lower rate of return of the bank will be taken as a signal of mismanagement and cause asset-preservation withdrawals. Thus, the use of PS modes has disciplinary effect on the banks as inefficiency and mismanagement are punished by depositors.

5.2. Liquidity Management

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[27] While there are many issues that can be discussed, the points discussed here are those that relate to the model.

The promise of banks to provide liquidity to the depositors makes liquidity management an integral part of banking practice. Evolution of liquidity management strategies in conventional banking illustrates the changing characteristics and development of instruments over time.[28] Before 1930s, the *commercial loan theory* maintained that banks focus on short-term self-liquidating loans that match the maturity of the deposits. A bank was considered liquid if the loan portfolio was entirely short-term. The *shiftability theory* asserted that any liquid asset could be used to meet deposit withdrawals. The growth of treasury bonds constituted the bulk of the liquid assets that could be sold in the secondary markets prior to maturity. During the early 1950s, the *anticipated income theory* tied loan payments to a borrower's expected income. To meet liquidity requirements, loans were structured in a way so that the timing of payments of the principal and interest matched borrowers' cash flow and ability to pay. More recently, the liability side of the bank is also used under the *liability management theory* under which banks borrow from the money market and capital markets to satisfy liquidity needs. Thus, both sides of the balance sheet are now used to manage liquidity of banks.

The liquidity management strategies outlined above indicate that Islamic banks face constraints in using some of them. The shiftability theory does not apply to Islamic banks, as there are limited Islamic financial assets that can be bought and sold. Similarly, Islamic banks are constrained in using liability management, as there is no Islamic money market from where they can borrow funds.[29] They can, however, use the anticipated income theory approach by carefully matching the withdrawals to expected income. The commercial loan theory to manage probably explains liquidity management of Islamic banks the best. This is reflected in Islamic banks concentration of short-term fixed-income assets. As pointed out, primary PS assets are less liquid. This may be another reason why Islamic banks have not used these instruments in their portfolios. One way to resolve the liquidity problem is to invest a part of the funds in secondary PS assets that are more liquid.

5.3. Risk Management Strategies

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28 The historical development discussed here is taken from Koch (1995, p. 481).

29 Due to lack of financial instruments, most Islamic banks have problems with excess liquidity. For a discussion on managing excess liquidity, see Ahmed (1997).

It has been shown above that Islamic banks face financial risks in using demand deposits, and business risks in using deposits that share profit/loss. The variability of returns also introduces withdrawal risks. This calls for different risk management strategies. Some specific schemes that can be taken up by banks are outlined below.

5.3.1. Stabilization of Rate of Return on Deposits

It has been noted that the withdrawal risk increases in Islamic banks if they are not able to give depositors a rate of return comparable to the market. To stabilize the returns of Islamic banks with that of their conventional counterpart, the former institutions can opt for following two options. First, create reserve funds from good performing periods to compensate depositors on bad performing years. The reserves may be used to cover either losses or equalize rate of return with the market. An example of the first kind is Jordan Islamic Bank's scheme of loss prevention reserves. A reserve is built by deducting a percentage of the profit of the bank to cover losses in non-performing periods. Similarly, Khan and Ahmed (2001) report that around forty percent of 17 Islamic financial institutions surveyed maintain rate of return equalizing reserves.

The second way to stabilize the rate of return is that the banks can use profit-sharing ratio in a staggered manner to reduce the variability of returns on deposits. When the net-income of the bank is smaller than expected, the profit share of depositors can be higher to keep the rate of return on deposits relatively stable. Note that this cannot be done *ex-post*, as an Islamic contract requires fixation of profit-sharing ratio ahead of the transaction. The banks can, however, work out a profit-sharing ratio *ex-ante* that depends on the profit of the bank. As the profitability of the bank increases, the share going towards the bank increases. Such a formula would not only make the return on deposits relatively more stable, but also has an incentive structure for the bank to manage its operations efficiently to maximize the profit. Note that this scheme of weakening the link between the variability of assets and deposits decreases the withdrawal risk, but increases the displaced commercial risk.

5.3.2. Asset Management: Combining PS with FI Mode

Instead of using either FI or PS mode to finance individual projects, Islamic banks can combine the two. Specifically, while the FI mode can be used

to finance fixed capital and real assets, funds can be made available on PS basis for working capital. To be acceptable from an Islamic point of view, however, FI and PS contracts cannot be conditional and must be independent. By combining FI and PS instruments in different ratios, a variety of risk-return profiles can be achieved for different projects. The share of FI and PS modes can vary with the project's risks. As the risk of a project increases, the share of FI mode of financing (γ_f) will become larger. In projects where uncertainty and risk are relatively small, Islamic banks can opt for a larger share of PS mode (γ_p).

Combining the FI and PS modes to finance a project brings Islamic banks closer to universal banking. Other than reducing the risks, universal banking may have other advantages. By holding shares, banks will have a say in the management of the firm. In the Islamic banking framework, this implies that the mode of financing will take the form of *musharakah* rather than *mudarabah*. Santos (1999) maintains that a mix of debt and equity holdings in a firm can reduce the moral hazard problem.[30] This strategy would reduce the overall business risks associated with PS instruments.

5.3.3. Bank Capital Allocation

Regulators require banks to hold capital to protect them from, among others, credit risk that banks face. New proposals from Basel Committee for Banking Supervision highlight capital requirement that is linked to the risks associated with assets.[31] Bank capital acts as a buffer for any negative net-worth in banking. While loss of an Islamic bank is shared by depositors, too much variability in the returns may increase the withdrawal risk. To reduce the variability of returns on the liability side, risky PS assets can be financed partly by bank capital and partly by investment deposits. One way to do this is to use

[30] Boyd, et.al. (1998) and Boyd (1999) argue that when deposit insurance exists, universal banking can increase the moral hazard problem faced by banks. This conclusion rests on the assumption that by holding equity position in firms (to whom loans are also advanced) the incentives of banks and firms align and the 'perks' gained by moral hazard behavior is also shared by the bank. Diamond (1998), however, opines that the conclusions of the model are not logical. For a discussion of the benefits and costs of commercial and universal banking see Santos (1998).

[31] For a discussion of regulatory capital for banks, see Khan and Ahmed (2001, Chapter 4).

the principle of risk-adjusted rate of return on capital (RAROC).[32] Under this method, first the risk associated with different assets needs to be estimated. The standard deviation of the return on specific assets serves as proxies for risk. To reduce the risk on deposits, equity capital is allocated to cover the expected loss of investment. Higher the risk and expected loss, higher is the equity allocated to the project. By doing this, a part of the risk and loss (if it occurs) is absorbed by bank capital. This will reduce the variance of the return on deposits.

Using bank capital in risky PS investments has another advantage. As the bank capital is used in the project, the moral hazard problem that exists in a principal-agent problem in banking relationships is reduced. With its own capital involved, the bank will be more careful in choosing the projects to invest (reducing the adverse selection problem) and monitor the activities of the firm (to minimize the moral hazard problem).

5.4. Quasi-Equity Deposits and Securitization

As mentioned earlier, people have different financial needs. They keep a part of savings in liquid form for current and unexpected expenditures and invest the remaining part in assets with different risk-return and maturity profiles. People use banks mainly for their liquidity needs. It has been shown that PS modes of financing are riskier with potentials of yielding higher returns. While investment deposits may serve only a part of investment need, there is a need to offer other forms of investment facilities to customers to enable people to park funds for longer time periods in riskier assets with higher expected rates of return. Attracting such funds will change the nature of liability and make withdrawals less sensitive to risk.

Islamic banks can offer a variety of investment services to tap funds from the public's preferences of different risk-return features. One possible option is to have mutual funds, where the bank invests funds in securities. It should be noted that some Islamic banks and conventional banks are already offering these products.[33] Mutual funds, however, will change the nature of

[32] For a discussion on RAROC, see Crouhy, et. al (2000, pp. 543-48).

[33] Examples of Islamic banks offering mutual funds are Abu Dhabi Islamic Bank, UAE; Al Rajhi Banking and Investment Bank, Saudi Arabia; Bank Islam Malaysia, Malaysia; and Al Baraka Investment Bank, Bahrain. Conventional banks that offer Islamic mutual funds include National Commercial Bank, Saudi Arabia; National

operations of banks to asset-management. Another possibility for banks is to raise funds by issuing securities for specific projects and fixed period of time. A way to distinguish between equity and such securities is to identify them as primary and secondary capital respectively.[34] As these quasi-equity securities represent shares in the projects, they can be sold in the secondary markets. While dividends are paid periodically, the capital can be redeemed at the end of the maturity of the security representing the end of the project life. Note that while funds from mutuals can be withdrawn, the funds from secondary capital remain intact with banks until the maturity date of the security.

6. Conclusion

Financial intermediaries specialize in managing risks. Different financial institutions can be identified by the nature of risks they deal with and manage. Conventional banks intermediate funds from depositors to entrepreneurs on interest. The risks associated in financing are managed, among other things, with collateral against which loans are sanctioned. Using profit sharing principle on the liability and asset sides is a unique feature of Islamic banking. The use of this mode introduces certain risks not found in conventional banks. The paper incorporates this feature in a microeconomic model to explain the composition of assets of an Islamic bank. Specifically, when depositors' preferences towards liquidity is considered, the paper shows that adopting PS modes on the asset side introduces risks that are not compatible with the liability side. This may explain the extensive use of relatively low-risk fixed-income instruments by Islamic banks in practice. The paper shows that when the bank acts as an investment intermediary it can increase the share of PS assets in its portfolio.

The paper points out some implications relating to performance and management of Islamic banks. While using PS modes on the liability side to reward depositors makes Islamic banks relatively more stable during economic downturns, it acts as a disciplinary tool for inefficient banks. Islamic banks, however, have limitations in using liquidity management strategies mainly due

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Bank of Kuwait, Kuwait; Arab National Bank, Saudi Arabia; and HSBC Bank, USA.

[34] These securities appear similar to limited-life (preferred) stock that is considered secondary capital in conventional banking literature. For a discussion on primary and secondary capital see Rose and Fraser (1988, pp. 396-97) .

to lack of Islamic money market and instruments. The risks arising from PS modes make the nature of Islamic banks different from conventional banks and calls for different strategies to manage these institutions. The paper provides some schemes that Islamic banks can adopt to reduce these risks. Creating reserve funds for use in times of low performance and staggered PS ratio can be used to de-link the returns on deposits from those of assets and make Islamic banks relatively more stable. On the asset side, risks associated with PS modes of financing can be lowered by blending FI and PS instruments. On the liability side combining equity and deposits to finance assets using PS modes will also reduce risks on returns on deposits. Furthermore, the liability side of the bank can be made more diversified to satisfy different risk/return/maturity features of the public. Possible products that can be offered include different types of quasi-equities and mutuals along with investment deposits. The bank will be able to invest these funds in PS assets without increasing withdrawal risk.

The paper shows that the nature of Islamic banks is different from that of conventional banks. Using PS modes not only implies that Islamic banks should have a balance sheet structure different from the conventional banks, but it also indicates that Islamic banks need to develop different strategies to run the institutions. In particular, PS modes of financing introduce unique risks that call for a new approach to manage them. Given this difference, it will be difficult to enhance PS modes of financing in Islamic banks if they operate within the framework of conventional banks (as liquidity providers) and follow their operations. While this paper provides some insights into the problems faced by Islamic banks, there is a need to conduct further research to understand the nature of risks these institutions face and to provide appropriate strategies for dealing with them.

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